

# SEQUENCE LISTING

## (1) GENERAL INFORMATION:

- (i) APPLICANT: Fischer, Gerald W.  
Schuman, Richard F.  
Wong, Hing  
Stinson, Jeffrey L.
- (ii) TITLE OF INVENTION: OPSONIC AND PROTECTIVE MONOCLONAL AND  
CHIMERIC ANTIBODIES SPECIFIC FOR LIPOTEICHOIC ACID OF GRAM  
POSITIVE BACTERIA
- (iii) NUMBER OF SEQUENCES: 89
- (iv) CORRESPONDENCE ADDRESS:
  - (A) ADDRESSEE: FINNEGAN, HENDERSON, FARABOW, GARRETT &  
DUNNER, LLP
  - (B) STREET: 1300 I Street, NW
  - (C) CITY: Washington
  - (D) STATE: DC
  - (E) COUNTRY: USA
  - (F) ZIP: 20005-3315
- (v) COMPUTER READABLE FORM:
  - (A) MEDIUM TYPE: Floppy disk
  - (B) COMPUTER: IBM PC compatible
  - (C) OPERATING SYSTEM: PC-DOS/MS-DOS
  - (D) SOFTWARE: PatentIn Release #1.0, Version #1.30
- (vi) CURRENT APPLICATION DATA:
  - (A) APPLICATION NUMBER: US 09/097,055
  - (B) FILING DATE: 15-JUN-1998
- (viii) ATTORNEY/AGENT INFORMATION:
  - (A) NAME: Einaudi, Carol P.
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  - (C) REFERENCE/DOCKET NUMBER: 04995.0041-00000
- (ix) TELECOMMUNICATION INFORMATION:
  - (A) TELEPHONE: 202-408-4000
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## (2) INFORMATION FOR SEQ ID NO:1:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 15 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS:
  - (D) TOPOLOGY: linear
- (ii) MOLECULE TYPE: peptide

**00000000000000000000000000000000**

Trp Arg Met Tyr Phe Ser His Arg His Ala His Leu Arg Ser Pro  
1 5 10 15

(2) INFORMATION FOR SEQ ID NO:2:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 15 amino acids
  - (B) TYPE: amino acid
  - (C) STRANDEDNESS:
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

Trp His Trp Arg His Arg Ile Pro Leu Gln Leu Ala Ala Gly Arg  
1 5 10 15

(2) INFORMATION FOR SEQ ID NO:3:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 21 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

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(ii) MOLECULE TYPE: other nucleic acid
(A) DESCRIPTION: /desc = "primer"
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(xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

TGAATTTTCT GTATGAGGTT T

21

(2) INFORMATION FOR SEQ ID NO:4:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 30 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:

- (A) NAME/KEY: CDS  
(B) LOCATION: 1..30

(xi) .SEQUENCE DESCRIPTION: SEQ ID NO:4:

GGG GCT CAT GCG GAT AGG GTT TAT GGG GCC  
 Gly Ala His Ala Asp Arg Val Tyr Gly Ala  
   1                  5                  10

30

(2) INFORMATION FOR SEQ ID NO:5:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 10 amino acids
  - (B) TYPE: amino acid
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

Gly Ala His Ala Asp Arg Val Tyr Gly Ala  
   1                  5                  10

(2) INFORMATION FOR SEQ ID NO:6:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 30 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:

- (A) NAME/KEY: CDS
- (B) LOCATION: 1..30

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

GGG ANT CAT GCG GAT AGG GTT TAT GGG GCC  
 Gly Xaa His Ala Asp Arg Val Tyr Gly Ala  
   1                  5                  10

30

(2) INFORMATION FOR SEQ ID NO:7:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 10 amino acids
  - (B) TYPE: amino acid
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:7:

Gly Xaa His Ala Asp Arg Val Tyr Gly Ala  
   1                  5                  10

(2) INFORMATION FOR SEQ ID NO:8:

[illegible]

(ix) FEATURE:

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

GGG GCT TGG CAT TGG CGT CAT CGT ATT CCT CTT CAG CTT GCT GCT GGT 48  
Gly Ala Trp His Trp Arg His Arg Ile Pro Leu Gln Leu Ala Ala Gly  
1 5 10 15

CGT GGG GCC 57  
Arg Gly Ala

(i) SEQUENCE CHARACTERISTICS:

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

Gly Ala Trp His Trp Arg His Arg Ile Pro Leu Gln Leu Ala Ala Gly  
1 5 10 15  
Arg Gly Ala

(2) INFORMATION FOR SEQ ID NO:10:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 57 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:

(A). NAME/KEY: CDS  
(B). LOCATION: 1..57

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

GGG GCT CGT CGG CAT GGT AAT TTT TCT CAT TTT TTT CAT CGG TCG TTG 48  
Gly Ala Arg Arg His Gly Asn Phe Ser His Phe Phe His Arg Ser Leu  
1 5 10 15

ATT GGG GCC 57  
Ile Gly Ala

(2) INFORMATION FOR SEQ ID NO:11:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 19 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:

Gly Ala Arg Arg His Gly Asn Phe Ser His Phe Phe His Arg Ser Leu  
1 5 10 15

Ile Gly Ala

(2) INFORMATION FOR SEQ ID NO:12:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 57 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:

- (A) NAME/KEY: CDS
- (B) LOCATION: 1..57

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

GGG GCT TGG AAG GCT TTG TTT AGT CAT TCT TAT CGT CCT CGG GGT TCG 48  
Gly Ala Trp Lys Ala Leu Phe Ser His Ser Tyr Arg Pro Arg Gly Ser  
1 5 10 15

GCT GGG GCC 57  
Ala Gly Ala

(2) INFORMATION FOR SEQ ID NO:13:

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(xi) SEQUENCE DESCRIPTION: SEQ ID NO:13:

(2) INFORMATION FOR SEQ ID NO:14:

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

(2) INFORMATION FOR SEQ ID NO:15:

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:15:

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[illegible]

(A) LENGTH: 57 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(ix) FEATURE:

(A) NAME/KEY: CDS  
(B) LOCATION: 1..57

GGG GCT TGG CAT TGG CGT CAT CGT ATT CCT CTT CAG CTT GCT GCT GGT  
Gly Ala Trp His Trp Arg His Arg Ile Pro Leu Gln Leu Ala Ala Gly  
1 5 10 15

48

CGT GGG GCC  
Arg Gly Ala

57

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 19 amino acids  
(B) TYPE: amino acid  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

Gly Ala Trp His Trp Arg His Arg Ile Pro Leu Gln Leu Ala Ala Gly  
1 5 10 15

Arg Gly Ala

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 57 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:

(A) NAME/KEY: CDS

(B) LOCATION: 1..57

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:18:

GGG GCT TGG CAT TGG CGT CAT CGT ATT CCT CTT CAG CTT GCT GCT GGT 48  
Gly Ala Trp His Trp Arg His Arg Ile Pro Leu Gln Leu Ala Ala Gly  
1 5 10 15  
CGT GGG GCC 57  
Arg Gly Ala

(2) INFORMATION FOR SEQ ID NO:19:

(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 19 amino acids  
(B) TYPE: amino acid  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:19:

Gly Ala Trp His Trp Arg His Arg Ile Pro Leu Gln Leu Ala Ala Gly  
1 5 10 15  
Arg Gly Ala

(2) INFORMATION FOR SEQ ID NO:20:

(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 57 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:  
(A) NAME/KEY: CDS  
(B) LOCATION: 1..57

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:20:

GGG GCT CAG GTG GCT GTT TTG TAT CCT CCT TTG GCT GAT GCT ACT GAG 48  
Gly Ala Gln Val Ala Val Leu Tyr Pro Pro Leu Ala Asp Ala Thr Glu  
1 5 10 15  
CTT GGG GCC 57  
Leu Gly Ala



(2) INFORMATION FOR SEQ ID NO:21:

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 19 amino acids  
    (B) TYPE: amino acid  
    (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:21:

Gly Ala Gln Val Ala Val Leu Tyr Pro Pro Leu Ala Asp Ala Thr Glu  
1                    5                    10                    15

Leu Gly Ala

(2) INFORMATION FOR SEQ ID NO:22:

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 57 base pairs  
    (B) TYPE: nucleic acid  
    (C) STRANDEDNESS: single  
    (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

- (ix) FEATURE:  
    (A) NAME/KEY: CDS  
    (B) LOCATION: 1..57

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:22:

GGG GCT CGT CGG CAT GGT AAT TTT TCT CAT TTT TTT CAT CGG TCG TTG                    48  
Gly Ala Arg Arg His Gly Asn Phe Ser His Phe Phe His Arg Ser Leu  
1                    5                    10                    15

ATT GGG GCC  57  
Ile Gly Ala

(2) INFORMATION FOR SEQ ID NO:23:

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 19 amino acids  
    (B) TYPE: amino acid  
    (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:23:

Gly Ala Arg Arg His Gly Asn Phe Ser His Phe Phe His Arg Ser Leu  
1                    5                    10                    15

09893615.062901

Ile Gly Ala

(2) INFORMATION FOR SEQ ID NO:24:

- (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 57 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:

- (A) NAME/KEY: CDS  
(B) LOCATION: 1..57

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:24:

GGG GCT CGT CGG CAT GGT AAT TTT TCT CAT TTT TTT CAT CGG TCG TTG	43
Gly Ala Arg Arg His Gly Asn Phe Ser His Phe Phe His Arg Ser Leu	
1 5 10 15	
ATT GGG GCC	57
Ile Gly Ala	

(2) INFORMATION FOR SEQ ID NO:25:

- (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 19 amino acids  
(B) TYPE: amino acid  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:25:

Gly Ala Arg Arg His Gly Asn Phe Ser His Phe Phe His Arg Ser Leu	
1 5 10 15	
Ile Gly Ala	

(2) INFORMATION FOR SEQ ID NO:26:

- (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 57 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:

- (A) NAME/KEY: CDS
- (B) LOCATION: 1..57

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:26:

GGG GCT TGG CGT ATG TAT TTT TCT CAT CGT CAT GCG CAT CTT CGT AGT	48
Gly Ala Trp Arg Met Tyr Phe Ser His Arg His Ala His Leu Arg Ser	
1 5 10 15	
CCT GGG GCC	57
Pro Gly Ala	

(2) INFORMATION FOR SEQ ID NO:27:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 19 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:27:

Gly Ala Trp Arg Met Tyr Phe Ser His Arg His Ala His Leu Arg Ser	
1 5 10 15	
Pro Gly Ala	

(2) INFORMATION FOR SEQ ID NO:28:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 57 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:

- (A) NAME/KEY: CDS
- (B) LOCATION: 1..57

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:28:

GGG GCT TGG CGT ATG TAT TTT TCT CAT CGT CAT GCG CAT CTT CGT AGT	48
Gly Ala Trp Arg Met Tyr Phe Ser His Arg His Ala His Leu Arg Ser	
1 5 10 15	
CCT GGG GCC	57
Pro Gly Ala	

(2) INFORMATION FOR SEQ ID NO:29:

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 19 amino acids  
    (B) TYPE: amino acid  
    (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:29:

Gly Ala Trp Arg Met Tyr Phe Ser His Arg His Ala His Leu Arg Ser  
1                    5                    10                    15

Pro Gly Ala

(2) INFORMATION FOR SEQ ID NO:30:

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 57 base pairs  
    (B) TYPE: nucleic acid  
    (C) STRANDEDNESS: single  
    (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

- (ix) FEATURE:  
    (A) NAME/KEY: CDS  
    (B) LOCATION: 1..57

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:30:

GGG GCT TGG CGG AAG TAT TTT TCT TAT CAT CAT GCG CAT CTT TGT AGT 48  
Gly Ala Trp Arg Lys Tyr Phe Ser Tyr His His Ala His Leu Cys Ser  
1                    5                    10                    15

CCT GGG GCC 57  
Pro Gly Ala

(2) INFORMATION FOR SEQ ID NO:31:

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 19 amino acids  
    (B) TYPE: amino acid  
    (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:31:

Gly Ala Trp Arg Lys Tyr Phe Ser Tyr His His Ala His Leu Cys Ser  
 1 5 10 15

Pro Gly Ala

(2) INFORMATION FOR SEQ ID NO:32:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 57 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

- (ix) FEATURE:
  - (A) NAME/KEY: CDS
  - (B) LOCATION: 1..57

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:32:

GGG GCT TGG CGT ATG TAT TTT TCT CAT CGT CAT GCG CAT CTT CGT AGT	48
Gly Ala Trp Arg Met Tyr Phe Ser His Arg His Ala His Leu Arg Ser	
1 5 10 15	
CCT GGG GCC	57
Pro Gly Ala	

(2) INFORMATION FOR SEQ ID NO:33:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 19 amino acids
  - (B) TYPE: amino acid
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:33:

Gly Ala Trp Arg Met Tyr Phe Ser His Arg His Ala His Leu Arg Ser
1 5 10 15
Pro Gly Ala

(2) INFORMATION FOR SEQ ID NO:34:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 57 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

09893615.062901

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:

- (A) NAME/KEY: CDS  
(B) LOCATION: 1..57

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:34:

GGG GCT TGG CGT ATG TAT TTT TCT CAT CGT CAT GCG CAT CTT CGT AGT 48  
Gly Ala Trp Arg Met Tyr Phe Ser His Arg His Ala His Leu Arg Ser  
1 5 10 15  
CCT GGG GCC 57  
Pro Gly Ala

(2) INFORMATION FOR SEQ ID NO:35:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 19 amino acids  
(B) TYPE: amino acid  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:35:

Gly Ala Trp Arg Met Tyr Phe Ser His Arg His Ala His Leu Arg Ser  
1 5 10 15  
Pro Gly Ala

(2) INFORMATION FOR SEQ ID NO:36:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 57 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:

- (A) NAME/KEY: CDS  
(B) LOCATION: 1..57

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:36:

GGG GCT TGG CGT ATG TAT TTT TCT CAT CGT CAT GCG CAT CTT CGT AGT 48  
Gly Ala Trp Arg Met Tyr Phe Ser His Arg His Ala His Leu Arg Ser  
1 5 10 15

37

(i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 19 amino acids  
 (B) TYPE: amino acid  
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:37;

Pro Gly Ala

(i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 57 base pairs  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

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(ix) FEATURE:
      (A) NAME/KEY: CDS
      (B) LOCATION: 1..57
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GGG GCT CGT CGG CAT GGT AAT TTT TCT CAT TTT TTT CAT CGG TCG TTG  
Gly Ala Arg Arg His Gly Asn Phe Ser His Phe Phe His Arg Ser Leu  
1 5 10 15

48

57

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 19 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

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(xi) SEQUENCE DESCRIPTION: SEQ ID NO:39:

Gly Ala Arg Arg His Gly Asn Phe Ser His Phe Phe His Arg Ser Leu  
1 5 10 15

Ile Gly Ala

(2) INFORMATION FOR SEQ ID NO:40:

- (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 57 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:

- (A) NAME/KEY: CDS  
(B) LOCATION: 1..57

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:40:

GGG GCT TGG CAT TGG CGT CAT CGT ATT CCT CTT CAG CTT GCT GCT GGT 48  
Gly Ala Trp His Trp Arg His Arg Ile Pro Leu Gln Leu Ala Ala Gly  
1 5 10 15

CGT GGG GCC 57  
Arg Gly Ala

(2) INFORMATION FOR SEQ ID NO:41:

- (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 19 amino acids  
(B) TYPE: amino acid  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:41:

Gly Ala Trp His Trp Arg His Arg Ile Pro Leu Gln Leu Ala Ala Gly  
1 5 10 15

Arg Gly Ala

(2) INFORMATION FOR SEQ ID NO:42:

- (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 57 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single



.....(D) TOPOLOGY: linear .....

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:

(A) NAME/KEY: CDS

(B) LOCATION: 1..57

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:42:

GGG GCT CGT CGG CAT GGT AAT TTT TCT CAT TTT TTT CAT CGG TCG TTG 48  
Gly Ala Arg Arg His Gly Asn Phe Ser His Phe Phe His Arg Ser Leu  
1 5 10 15

ATT GGG GCC  
Ile Gly Ala 57

(2) INFORMATION FOR SEQ ID NO:43:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 19 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:43:

Gly Ala Arg Arg His Gly Asn Phe Ser His Phe Phe His Arg Ser Leu  
1 5 10 15

Ile Gly Ala

(2) INFORMATION FOR SEQ ID NO:44:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 57 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:

(A) NAME/KEY: CDS

(B) LOCATION: 1..57

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:44:

GGG GCT GAT TGG ATT ACT TTT CAT CGT CGT CAT CAT GAT CGT GTT CTT 48  
 Gly Ala Asp Trp Ile Thr Phe His Arg Arg His His Asp Arg Val Leu  
 1 5 10 15

TCT GGG GCC 57  
 Ser Gly Ala

(2) INFORMATION FOR SEQ ID NO:45:

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 19 amino acids  
 (B) TYPE: amino acid  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:45:

Gly Ala Asp Trp Ile Thr Phe His Arg Arg His His Asp Arg Val Leu  
 1 5 10 15

Ser Gly Ala

(2) INFORMATION FOR SEQ ID NO:46:

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 57 base pairs  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

- (ix) FEATURE:  
 (A) NAME/KEY: CDS  
 (B) LOCATION: 1..57

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:46:

GGG GCT GGT TGG ATT ACT TTT CAT CGT CGT CAT CAT GAT CGT GTT CTT 48  
 Gly Ala Gly Trp Ile Thr Phe His Arg Arg His His Asp Arg Val Leu  
 1 5 10 15

TCT GGG GCC 57  
 Ser Gly Ala

(2) INFORMATION FOR SEQ ID NO:47:

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 19 amino acids  
 (B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:47:

Gly Ala Gly Trp Ile Thr Phe His Arg Arg His His Asp Arg Val Leu  
1 5 10 15

Ser Gly Ala

(2) INFORMATION FOR SEQ ID NO:48:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 57 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:

- (A) NAME/KEY: CDS
- (B) LOCATION: 1..57

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:48:

GGG GCT GGG AAG GCT ATG TTT AGT CAT TCT TAT CGT CAT CGG GGT TCG 48  
Gly Ala Gly Lys Ala Met Phe Ser His Ser Tyr Arg His Arg Gly Ser  
1 5 10 15

GCT GGG GCC 57  
Ala Gly Ala

(2) INFORMATION FOR SEQ ID NO:49:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 19 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:49:

Gly Ala Gly Lys Ala Met Phe Ser His Ser Tyr Arg His Arg Gly Ser  
1 5 10 15

Ala Gly Ala

(2) INFORMATION FOR SEQ ID NO:50:



(xi) SEQUENCE DESCRIPTION: SEQ ID NO:52:

GGG GCT AGT CGT CAT ATG CTT GCT CGG TGG TCG CGT TTG CTT GCT GTT  
Gly Ala Ser Arg His Met Leu Ala Arg Trp Ser Arg Leu Leu Ala Val  
1 5 10 15

48

CCT GGG GCC  
Pro Gly Ala

57

(2) INFORMATION FOR SEQ ID NO:53:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 19 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:53:

Gly Ala Ser Arg His Met Leu Ala Arg Trp Ser Arg Leu Leu Ala Val  
1 5 10 15

Pro Gly Ala

(2) INFORMATION FOR SEQ ID NO:54:

(i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 57 base pairs  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

```
(ix) FEATURE:
      (A) NAME/KEY: CDS
      (B) LOCATION: 1..57
```

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:54:

GGG GCT GGG AAG GCT ATG TTT AGT CAT TCT TAT CGT CAT CGG GGT TCG  
Gly Ala Gly Lys Ala Met Phe Ser His Ser Tyr Arg His Arg Gly Ser  
1 5 10 15

48

GCT GGG GCC  
Ala Gly Ala

57

(2) INFORMATION FOR SEQ ID NO:55:

(i) SEQUENCE CHARACTERISTICS:

**SECRET**

- (A) LENGTH: 19 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:55:

Gly Ala Gly Lys Ala Met Phe Ser His Ser Tyr Arg His Arg Gly Ser  
 1 5 10 15

Ala Gly Ala

(2) INFORMATION FOR SEQ ID NO:56:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 57 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:

- (A) NAME/KEY: CDS
- (B) LOCATION: 1..57

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:56:

GGG GCT TGG CAT TGG CGT CAT CGT ATT CCT CTT CAG CTT GCT GCT GGT 48  
 Gly Ala Trp His Trp Arg His Arg Ile Pro Leu Gln Leu Ala Ala Gly  
 1 5 10 15

CGT GGG GCC 57  
 Arg Gly Ala

(2) INFORMATION FOR SEQ ID NO:57:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 19 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:57:

Gly Ala Trp His Trp Arg His Arg Ile Pro Leu Gln Leu Ala Ala Gly  
 1 5 10 15

Arg Gly Ala

(2) INFORMATION FOR SEQ ID NO:58:

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 57 base pairs  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

- (ix) FEATURE:  
 (A) NAME/KEY: CDS  
 (B) LOCATION: 1..57

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:58:

GGG GCT CGT CGG CAT GGT AAT TTT TCT CAT TTT TTT CAT CGG TCG TTG 48  
Gly Ala Arg Arg His Gly Asn Phe Ser His Phe Phe His Arg Ser Leu  
1 5 10 15

ATT GGG GCC 57  
Ile Gly Ala

(2) INFORMATION FOR SEQ ID NO:59:

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 19 amino acids  
 (B) TYPE: amino acid  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:59:

Gly Ala Arg Arg His Gly Asn Phe Ser His Phe Phe His Arg Ser Leu  
1 5 10 15

Ile Gly Ala

(2) INFORMATION FOR SEQ ID NO:60:

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 57 base pairs  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

- (ix) FEATURE:  
 (A) NAME/KEY: CDS  
 (B) LOCATION: 1..57

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:60:

GGG GCT TGG AAG GCT TTG TTT AGT CAT TCT TAT CGT CCT CGG GGT TCG 48  
Gly Ala Trp Lys Ala Leu Phe Ser His Ser Tyr Arg Pro Arg Gly Ser  
1 5 10 15  
GCT GGG GCC 57  
Ala Gly Ala

(2) INFORMATION FOR SEQ ID NO:61:

- (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 19 amino acids  
(B) TYPE: amino acid  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:61:

Gly Ala Trp Lys Ala Leu Phe Ser His Ser Tyr Arg Pro Arg Gly Ser  
1 5 10 15  
Ala Gly Ala

(2) INFORMATION FOR SEQ ID NO:62:

- (i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 57 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:

- (A) NAME/KEY: CDS  
(B) LOCATION: 1..57

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:62:

GGG GCT CAG GTG GCT GTT TTG TAT CCT CCT TTG GCT GAT GCT ACT GAG 48  
Gly Ala Gln Val Ala Val Leu Tyr Pro Pro Leu Ala Asp Ala Thr Glu  
1 5 10 15  
CTT GGG GCC 57  
Leu Gly Ala

(2) INFORMATION FOR SEQ ID NO:63:



- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 19 amino acids
  - (B) TYPE: amino acid
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:63:

Gly Ala Gln Val Ala Val Leu Tyr Pro Pro Leu Ala Asp Ala Thr Glu  
 1 5 10 15

Leu Gly Ala

(2) INFORMATION FOR SEQ ID NO:64:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 57 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:

- (A) NAME/KEY: CDS
- (B) LOCATION: 1..57

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:64:

GGG GCT TGG CGT ATG TAT TTT TCT CAT CGT CAT GCG CAT CTT CGT AGT 43  
 Gly Ala Trp Arg Met Tyr Phe Ser His Arg His Ala His Leu Arg Ser  
 1 5 10 15

CCT GGG GCC 57  
 Pro Gly Ala

(2) INFORMATION FOR SEQ ID NO:65:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 19 amino acids
  - (B) TYPE: amino acid
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:65:

Gly Ala Trp Arg Met Tyr Phe Ser His Arg His Ala His Leu Arg Ser  
 1 5 10 15

Pro Gly Ala

(2) INFORMATION FOR SEQ ID NO:66:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 30 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

- (ix) FEATURE:
  - (A) NAME/KEY: CDS
  - (B) LOCATION: 1..30

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:66:

GGG GCT CAT GCG GAT AGG GTT TAT GGG GCC  
Gly Ala His Ala Asp Arg Val Tyr Gly Ala  
1 5 10

30

(2) INFORMATION FOR SEQ ID NO:67:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 10 amino acids
  - (B) TYPE: amino acid
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:67:

Gly Ala His Ala Asp Arg Val Tyr Gly Ala  
1 5 10

(2) INFORMATION FOR SEQ ID NO:68:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 45 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

- (ii) MOLECULE TYPE: other nucleic acid
  - (A) DESCRIPTION: /desc = "primer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:68:

ATTTGAGGCC CAGCCGGCCA TGGCCGARGT RMAGCTKSAX GAGWC

45

(2) INFORMATION FOR SEQ ID NO:69:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 45 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

- (ii) MOLECULE TYPE: other nucleic acid
  - (A) DESCRIPTION: /desc = "primer"

- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:69:

ATTTCAGGCC CAGCCGGCCA TGGCCGARGT YCARCTKCAR CARYC

45

- (2) INFORMATION FOR SEQ ID NO:70:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 45 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

- (ii) MOLECULE TYPE: other nucleic acid
  - (A) DESCRIPTION: /desc = "primer"

- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:70:

ATTTCAGGCC CAGCCGGCCA TGGCCCAGGT GAAGCTKSTS GARTC

45

- (2) INFORMATION FOR SEQ ID NO:71:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 45 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: single
  - (D) TOPOLOGY: linear

- (ii) MOLECULE TYPE: other nucleic acid
  - (A) DESCRIPTION: /desc = "primer"

- (xi) SEQUENCE DESCRIPTION: SEQ ID NO:71:

ATTTCAGGCC CAGCCGGCCA TGGCCGAVGT GMWGCTKGTG GAGWC

45

- (2) INFORMATION FOR SEQ ID NO:72:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 45 base pairs
  - (B) TYPE: nucleic acid

[illegible]

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:72:

45

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:73:

35

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:74:

35

(ii) MOLECULE TYPE: other nucleic acid

(A) DESCRIPTION: /desc = "primer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:75:

GCTGCCACCG CCACCTGMRG AGACDGTGAS CAGRG

35

(2) INFORMATION FOR SEQ ID NO:76:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 32 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: other nucleic acid

(A) DESCRIPTION: /desc = "primer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:76:

CCCCGGCCAC CATGGAGACA GACACACTCC TG

32

(2) INFORMATION FOR SEQ ID NO:77:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 35 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: other nucleic acid

(A) DESCRIPTION: /desc = "primer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:77:

CCCCGGCCAC CATGGATTTT CAAGTGCAGA TTTTC

35

(2) INFORMATION FOR SEQ ID NO:78:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 32 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: other nucleic acid

(A) DESCRIPTION: /desc = "primer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:78:

CCCCGGGCCAC CATGGAGWCA CAKWCTCAGG TC

32

(2) INFORMATION FOR SEQ ID NO:79:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 33 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: other nucleic acid

(A) DESCRIPTION: /desc = "primer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:79:

CCCCGGGCCAC CATGKCCCCW RCTCAGYTTC TKG

33

(2) INFORMATION FOR SEQ ID NO:80:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 31 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: other nucleic acid

(A) DESCRIPTION: /desc = "primer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:80:

CCCCGGGCACC ATGAAGTTGC CTGTTAGGCT G

31

(2) INFORMATION FOR SEQ ID NO:81:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 23 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: other nucleic acid

(A) DESCRIPTION: /desc = "primer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:81:

GCACCTCCAG ATGTTAAGTC CTC

23

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2
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(A) LENGTH: 54 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(A) DESCRIPTION: /desc = "primer"

## 54

(A) LENGTH: 30 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(A) DESCRIPTION: /desc = "primer"

30 .

(A) LENGTH: 29 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: single  
(D) TOPOLOGY: linear

(A) DESCRIPTION: /desc = "primer"

## 29

## 102

(A) LENGTH: 46 base pairs  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: other nucleic acid  
 (A) DESCRIPTION: /desc = "primer"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:85:

GTAACCGTTC GAAAAGTGTA CTTACGTTTT ATTTCCAGCA TGGTCC

46

(2) INFORMATION FOR SEQ ID NO:86:

(i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 369 base pairs  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

(ix) FEATURE:  
 (A) NAME/KEY: CDS  
 (B) LOCATION: 1..369

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:86:

GAA GTG ATG CTG GTG GAG TCT GGT GGA GGA TTG GTG CAG CCT AAA GGG	48
Glu Val Met Leu Val Glu Ser Gly Gly Leu Val Gln Pro Lys Gly	
1 5 10 15	
TCA TTG AAA CTC TCA TGT GCA GCC TCT GGA TTC ACC TTC AAT AAC TAC	96
Ser Leu Lys Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Asn Asn Tyr	
20 25 30	
GCC ATG AAT TGG GTC CGC CAG GCT CCA GGA AAG GGT TTG GAA TGG GTT	144
Ala Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val	
35 40 45	
GCT CGC ATA AGA AGT AAA AGT AAT AAT TAT GCA ACA TTT TAT GCC GAT	192
Ala Arg Ile Arg Ser Lys Ser Asn Asn Tyr Ala Thr Phe Tyr Ala Asp	
50 55 60	
TCA GTG AAA GAC AGG TTC ACC ATC TCC AGA GAT GAT TCA CAA AGC ATG	240
Ser Val Lys Asp Arg Phe Thr Ile Ser Arg Asp Asp Ser Gln Ser Met	
65 70 75 80	
CTC TAT CTG CAA ATG AAC AAC TTG AAA ACT GAG GAC ACA GCC ATG TAT	288
Leu Tyr Leu Gln Met Asn Asn Leu Lys Thr Glu Asp Thr Ala Met Tyr	
85 90 95	



TAC TGT GTG AGA CGG GGG GCT TCA GGG ATT GAC TAT GCT ATG GAC TAC 336  
 Tyr Cys Val Arg Arg Gly Ala Ser Gly Ile Asp Tyr Ala Met Asp Tyr  
                   100                  105                  110

TGG GGT CAA GGA ACC TCA CTC ACC GTC TCC TCA 369  
 Trp Gly Gln Gly Thr Ser Leu Thr Val Ser Ser  
                   115                  120

(2) INFORMATION FOR SEQ ID NO:87:

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 123 amino acids  
 (B) TYPE: amino acid  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:87:

Glu Val Met Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Lys Gly  
   1                          5                          10                          15  
 Ser Leu Lys Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Asn Asn Tyr  
                   20                          25                          30  
 Ala Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val  
                   35                          40                          45  
 Ala Arg Ile Arg Ser Lys Ser Asn Asn Tyr Ala Thr Phe Tyr Ala Asp  
                   50                          55                          60  
 Ser Val Lys Asp Arg Phe Thr Ile Ser Arg Asp Asp Ser Gln Ser Met  
                   65                          70                          75                          80  
 Leu Tyr Leu Gln Met Asn Asn Leu Lys Thr Glu Asp Thr Ala Met Tyr  
                           85                          90                          95  
 Tyr Cys Val Arg Arg Gly Ala Ser Gly Ile Asp Tyr Ala Met Asp Tyr  
                   100                          105                          110  
 Trp Gly Gln Gly Thr Ser Leu Thr Val Ser Ser  
                   115                          120

(2) INFORMATION FOR SEQ ID NO:88:

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 318 base pairs  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: cDNA

- (ix) FEATURE:  
 (A) NAME/KEY: CDS  
 (B) LOCATION: 1..318

06693615 062901  
106290 57926860

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:88:

CAA ATT GTT CTC TCC CAG TCT CCA GCA ATC CTG TCT GCA TCT CCA GGG	48
Gln Ile Val Leu Ser Gln Ser Pro Ala Ile Leu Ser Ala Ser Pro Gly	
1 5 10 15	
GAA AAG GTC ACA ATG ACT TGC AGG GCC AGC TCA AGT GTA AAT TAC ATG	96
Glu Lys Val Thr Met Thr Cys Arg Ala Ser Ser Ser Val Asn Tyr Met	
20 25 30	
CAC TGG TAC CAG CAG AAG CCA GGA TCC TCC CCC AAA CCC TGG ATT TCT	144
His Trp Tyr Gln Gln Lys Pro Gly Ser Ser Pro Lys Pro Trp Ile Ser	
35 40 45	
GCC ACA TCC AAC CTG GCT TCT GGA GTC CCT GCT CGC TTC AGT GGC AGT	192
Ala Thr Ser Asn Leu Ala Ser Gly Val Pro Ala Arg Phe Ser Gly Ser	
50 55 60	
GGG TCT GGG ACC TCT TAC TCT CTC ACA ATC AGC AGA GTG GAG GCT GAA	240
Gly Ser Gly Thr Ser Tyr Ser Leu Thr Ile Ser Arg Val Glu Ala Glu	
65 70 75 80	
GAT GCT GCC ACT TAT TAC TGC CAG CAG TGG AGT AGT AAC CCA CCC ACG	288
Asp Ala Ala Thr Tyr Tyr Cys Gln Gln Trp Ser Ser Asn Pro Pro Thr	
85 90 95	
TTC GGA GGG GGG ACC ATG CTG GAA ATA AGA	318
Phe Gly Gly Gly Thr Met Leu Glu Ile Arg	
100 105	

(2) INFORMATION FOR SEQ ID NO:89:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 106 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: protein

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:89:

Gln Ile Val Leu Ser Gln Ser Pro Ala Ile Leu Ser Ala Ser Pro Gly	
1 5 10 15	
Glu Lys Val Thr Met Thr Cys Arg Ala Ser Ser Ser Val Asn Tyr Met	
20 25 30	
His Trp Tyr Gln Gln Lys Pro Gly Ser Ser Pro Lys Pro Trp Ile Ser	
35 40 45	
Ala Thr Ser Asn Leu Ala Ser Gly Val Pro Ala Arg Phe Ser Gly Ser	
50 55 60	
Gly Ser Gly Thr Ser Tyr Ser Leu Thr Ile Ser Arg Val Glu Ala Glu	
65 70 75 80	

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99